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ABSTRACT

The purpose of the study reported in this paper was to investigate the effectiveness of music as a mediation factor in the learning and retention of lexical units in German language sequences. The main question to be considered was whether or not the addition of melody and rhythm would constitute an aid or a hindrance to the Ss in learning the body of a text, as measured by retention of individual items within the sequences originally presented. Thirty-eight subjects, nineteen boys and nineteen girls, were selected from seventh grade beginning German classes in a midwestern junior high school. Two media consisting of four songs and four dialogs were used. Tests for retention of items in the original context were of four types: German-cued recognition, English-cued recognition, uncued recall, and English-cued recall. A German-cued recognition test was used to retest all items in a different context. The results indicate that music is an effective mediating factor in the learning and retention of lexical items in German language sequences, and that boys in particular appear to benefit in learning such materials with addition of the kinesthetic and sensory experiences afforded by listening to and singing songs. (Author/CLK)h

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THE EFFECT OF MUSIC IN THE LEARNING AND RETENTION OF LEXICAL ITEMS IN GERMAN

Sidney L. Hahn

Man's basic tool of communication is language. The acquisition of the linguistic system and its building blocks--vocabulary--which enable the users of a language to communicate with one another is clearly a learned and highly complex activity. In 1953 Osgood (p. 727) noted:

> In terms of its central relevance to general psychological theory and potential applicability to complex social problems, no other area of experimental psychology so greatly demands attention as language behavior--and in the past has received so little.

Despite the progress made in the intervening years, so much remains to be studied and accounted for in language learning that Osgood's observation must still be considered valid. If this is true of the study of language behavior generally, it is even more pronounced in the area of foreign language skills acquisition. Vocabulary learning in particular has escaped the attention of researchers. "Unless one counts the multitudinous studies in 'verbal learning' through the study of paired-associate learning, there has been almost no progress in research on vocabulary learning in FL. . ." (Carroll, 1970, p. 34).

Theories of language and language learning which include the aspect of human communication, either in contrast to or in addition to the abstraction of a symbolic linguistic code, refer to the necessity for individual decoding, encoding (Osgood, 1953) and storage of verbal sequences. The major usage of such recalled verbal sequences, as stated by Gagné (1965) is in the area of language itself--specifically, in the construction of verbal utterances that communicate ideas.

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The learning and storage mechanism itself, however, is not fully understood. Osgood (1962) and Mowrer (1960) among others, propose and describe theories of mediation in verbal behavior, particularly in regard to "meaning" which Osgood (1962, p. 10) defines as "a representational mediation process." For Mowrer (1960) there is always the additional element of emotion present in associational meaning. Others have emphasized the important role played by emotion in a child's learning of his mother tongue. This aspect has been largely disregarded in foreign language learning theory. Recently the emphasis has most often been placed upon the subordination of meaning and its concomitant emotional factor in the early stages of foreign language learning in favor of the development of automatic responses.

The vocabulary load is usually kept small in the beginning phases of foreign language learning in order to allow the necessary time and attention to be devoted to phonological and structural problems. Although vocabulary learning per se cannot be considered the most important goal of early foreign language study, foreign language vocabulary learning as a process can be more reasonably and easily studied while the total volume of vocabulary is small and readily measurable. Knowledge of how vocabulary learning may be facilitated is important since, as stated by Carroll (1965, p. 1075): "After the sounds and structure of the language has been reasonably well mastered, knowledge of the language grows chiefly in proportion to increasing vocabulary knowledge." According to Gagné (1965) the learning of a two-element verbal association, or translation, requires the use of an intervening link, having the function of mediation or coding. He suggests the deliberate use of visual images or auditory images such as rhymes to serve this function.

Rhythm and rhyme and even melody have probably always been important in the oral transmitting of thought, narrative, precept, and praise. Ancient and extant rhymed sayings and incantations, Biblical passages including the Psalms, medieval epic poetry, and folk song provide obvious examples. Today advertisers exploit rhyme, rhythm and melody, together with repetition, in the form of the "singing commercial" with the intent of aiding memory and building automatic associations.

There has been little actual investigation of whether and/or how music aids the learner in assimilating and remembering lexical items and sequences in a foreign language. Initial observations cited in a preliminary report of a long-term FLES study in progress (van Asselt, 1971) suggest support for the hypothesis that rhyme, rhythm and melody aid in the process of memorization and retention when song is used as the vehicle for teaching German to children.

The present study was concerned with investigating the effectiveness of music as a presentational mediation factor in the encoding and storing of lexical units in German language sequences, as indicated by later recall and recognition. The unique attribute of music is the possibility of nonverbal aesthetic communication through rhythm and melody. Rhythm and melody are affective (emotional) elements which may be effectively combined with rhyme and repetition. In the learning of longer sequences, repetition has been cited by Gagné (1965) as the most important condition. Since adding music, however, automatically increases the volume of material to be learned, the main question to be considered was whether or not the addition of melody and rhythm would constitute an aid or a hindrance to the Ss in learning the body of a text, as measured by retention of individual items within the sequences originally presented.

PROCEDURE

Thirty-eight subjects, nineteen boys and nineteen girls, were selected from seventh grade beginning (second semester) German classes in a mid-western junior high school. They were within the measured intelligence range of students in regular public school classes and of the mean age of twelve years. IQ range was from 79-145. None of the subjects were enrolled in either band or orchestra. All had had a first semester general music class required of students not enrolled in instrumental music. Students following this schedule were randomly assigned by computer to one of the two German sections involved in the study. Two media consisting of four songs and four dialogs (plus supplements) were used. The procedure included three divisions: (1) teaching the songs, dialogs and supplements (dialog expension material) to the subjects; (2) testing for recognition and recall in sentence context of nouns, verbs and other words presented in the songs, dialogs and supplements; and (3) evaluation of differences in retention scores obtained by male and female subjects of varying intelligence.

MATERIALS

Songs

The singing of songs in foreign language classes is an accepted and familiar classroom procedure. It has not been done, for the most part, however, for the express purpose of teaching vocabulary items in secondary school German classes. Songs to be used as a vocabulary-teaching tool had of necessity to be chosen on a different basis, then, than obtains in the usual case. Of primary importance in the selection were

the actual lexical units contained. It was deemed most important that these be in standard, contemporary, high-frequency usage. The best source from this standpoint was found to be Schlager--current "hit" tunes. Since interest to the students was also considered an important criterion, such tunes were doubly useful as vehicles for vocabulary presentation. Schlager as a general category also afford the qualities found by Lathom (1970) to aid retention when rote teaching is undertaken. A minimum amount of drill and repetition was desirable and Lathom's study indicated that "songs with lyrics, form, harmony, melody, and rhythm that is predictable will be easiest for the children to learn." (p. 133) She also found that this is important in achieving maximum retention.

Other criteria were generally the same as those listed by Ellison (1959, p. 82) in selecting a record for classroom use. Variety in style and rhythm were influencing factors in the final selection as well as the teacher's (investigator's) judgment as to overall suitability and appeal to the students serving as subjects.

Five songs were chosen including one which served as a preliminary demonstration of the method to be used in teaching by song. A separate tape recording of each was prepared from the tape or record at hand. All four songs used in the experiment proper were sung by a man, the demonstration song by a woman. All five utilized an instrumental accompaniment.

Dialogs

The dialogs were those in the regular sequence of the course of study: Units 6 and 7, A-LM German: Level I, second edition (1969). Each dialog is eight to ten lines long and is divided into two parts.

The supplement introduces additional lexical items in sentences related to, and sometimes taken from, the dialog. It is also divided into two parts, each of which corresponds to a section of the dialog, in a sense, functioning as a "second verse" to its corresponding dialog section.

Vocabulary Analysis

A total word count was obtained for each song, dialog and supplement, and each separate word was checked as to its listing in Pfeffer's (1965) word list of basic spoken German. A breakdown was made in terms of: (1) words previously presented to the Ss in units 1-5; (2) density ratio of new words to total number of different words in each; (3) those words which had not been formally presented in the textbook, but which were presumed familiar to some or all of the Ss from having been used by the teacher during the course of instruction, and obvious cognates. The latter words were designated as the category "borderline and cognate." Words were grouped also according to the classification noun, verb or "other." (This factor was not dealt with formally, however, because of unequal numbers in these categories.) Words appearing in more than one song and/or dialog were listed. They were considered "new" in the count only on initial presentation. In selecting songs for the study, an effort was also made to avoid regionalisms or colloquialisms, and to select only songs having generally acceptable grammatical and word order patterns.

METHOD

The investigator presented and tested all materials, using the same procedure for songs and dialogs, and similar visual aids for both media.

Order of presentation was systematically varied in an interlocking pattern. Instruction was given in fourteen regular class periods of fifty-five minutes each, meeting on alternate days, and extending over a six-week time span. A preliminary song was taught and tested prior to the beginning of the experiment to familiarize the Ss with the song method of vocabulary learning. Each song and dialog-supplement portion was presented and practiced for twenty minutes of the class period, repeated in the subsequent class period, and tested at the beginning of the third meeting. Each period thus included presentation of new material, practice on previously presented material and testing until all four songs and four dialog-supplement sections were covered. All other drill activity was suspended during the experimental period.

Teaching the Dialogs

In general the method used throughout the year and continued in the study closely followed that outlined in the teachers edition of A-LM (p. T1-50). Each dialog section used in the study was first presented orally by the teacher in English to establish meaning, then in German, using the dialog posters which accompany the series. Practice consisted of choral repetition with the teacher's voice or a tape recording serving as a model. Both the English and German sentences as printed in the textbook were allowed to be open on the desk before each subject. The corresponding dialog supplement section was similarly practiced with suitable illustrations. In the second session students also copied the dialog and new words contained in the supplement and handed the papers in for correction. In order to control further the amount of time spent in learning the materials, no textbooks were checked out to the Ss during the period

of the experiment. (Both classes used the same set of textbooks.) At all times memorization of the German, accurate reproduction of intonation patterns (sentence melody) and correct articulation of the speech sounds were emphasized and expected as a matter of routine.

Teaching the Songs

The technique of teaching by rote a song in a foreign language is almost identical with that of teaching a dialog audio-lingually. Meaning of the lyrics should be made clear before the German lines are learned, just as in teaching a dialog. This was accomplished by presenting a translation in idiomatic English printed on a previously prepared transparency for the overhead projector. The German lyrics were presented on a second transparency. A set of posters illustrating each song was used. The artist had been asked to produce pictures as nearly identical as possible in format and style to those commercially prepared to accompany the A-LM dialogs. As in the dialog teaching procedure, the posters were used while introducing and practicing both the English and German lines to be learned.

After a few introductory remarks about the song the teacher asked the Ss to follow first the English words then the German words as a tape recording of the song was played. The recording was played a third time and the Ss were invited to "sing along" or join in the chorus if they wished. Each line was then sung by the teacher and repeated by the class. Necessary corrections, discussion, or answers to questions were given as the occasion demanded as was true of the initial dialog presentations. During the second song period, the students were asked to sing the song from memory at least

once, and once without the recording. They also copied and handed in the German lyrics.

Absence and Make-Up Work

As in any normal school situation, it was expected that some pupils would occasionally be absent during the six-week period of time required for the study. Since the students understood that the learning and testing of the dialogs and songs was regular class work, they expected to make up any work missed. Five boys and five girls made up work in eight after-school sessions at various times. When possible, small groups of two, three or four made up work together. While it is not possible to duplicate the work missed in class in all details, the effects may be assumed to have been randomized among all subjects, and cancelled between males and females since the same number of boys and girls happened to have missed at least one day. Long absences of one week or more (two-four class periods) were also virtually equal between boys and girls and fortunately few in number.

Testing Procedure

Schedule

Testing for retention of items in each song or dialog-supplement unit always followed the second presentation of that material, and was scheduled for the first ten minutes of the next (third) class period. It occured after a time lag equal to that between presentations, ranging from Monday to Wednesday to Friday to Tuesday, or from Tuesday to Thursday to Monday on an alternating weekly basis. A maximum of ten minutes was allowed for

completion of each test. The four forms of each test were administered simultaneously following a systematically varied plan of randomization.

Format

Tests for retention consisted of four types: German-cued recognition, English-cued recognition, uncued recall, and English-cued recall. The tests were evaluated by experts according to specific criteria (adopted from Lado, 1961) of item independence and suitability prior to use.

Approximately one-half of the verbs, nouns and other lexical units in each lesson designated as new (including the category borderline and cognate) were randomly selected and tested. Each subject received one of four different test forms labeled V, W, X, or Y. The same vocabulary entries (ten in number) were tested in each form. At the end of the experiment, each S had received one of each of the four forms testing song vocabulary and one of each of the equivalent dialog-supplement test forms making a total of eight. These tests required either recognition (multiple-choice) or recall (fill-in) of each item in the same context in which it was originally presented. The same lexical units were then retested in another test, Vocabulary Test Z, requiring recognition of each item in a different context than that of original presentation. Eighty items, forty song words and forty dialog-supplement words, were tested in total.

A questionnaire was submitted to the Ss for recording individual attitudes and responses to the materials and procedures used. A log was also kept by the investigator throughout the course of the experiment.

RESULTS

A mixed-model analysis of variance design, BMD08V (1967) was used

to evaluate the differences among retention scores for songs and dialog-supplements. Main effects were determined for the factors: A = sex (boy-girl); C = media (dialog-song); D = response (recognition-recall); and E = response (German-English-cued). In this design the factor of individual subjects (B) was treated as being "nested" within the factor of sex (A) and "crossed" with factors C, C, and E. While five factors are specified in the model, the overall design may be thought of as an evaluation of a single factor--that of retention. Table 1 presents the results pertinent to the study of the five-factor analysis in terms of main effects and interaction effects. Interpretation of the F ratios which were significant is facilitated by inspection of the separate means for each level of response in relation to the presentational media; therefore this data is shown in Table 2.

The overall difference in media was significant at the .05 level; that is, the $\bar{X}$ retention score for songs was statistically different at the .05 level from the $\bar{X}$ retention score for dialog-supplements when all tests were combined for all subjects. The $\bar{X}$ was higher for songs.

The difference between the $\bar{X}$ scores of the boys and the $\bar{X}$ scores of the girls for item retention was significant at the .01 level when all tests were combined. The $\bar{X}$ score obtained by the boys was higher for songs, whereas the girls had a higher $\bar{X}$ score for dialogs.

Interaction between media and sex of the Ss was also significant at the .05 level. The data indicate that the highest degree of retention was achieved by boys when song materials were utilized, and by girls when dialog materials were used. However, the girls also had a higher $\bar{X}$ score for song item retention when the English-cued recall response tests were the instrument of measurement. Inspection of table of means for the various interaction

factors (Table 2) shows that the boys scored consistently higher on songs than on dialogs, whereas the reverse was true for the girls. However, it may also be noted that the girls scored higher than the boys on both media, and that the differential between song and dialog scores was generally smaller for girls than for boys.

A significant difference in retention scores of boys and girls was again obtained when scores from the four types of tests were analyzed with the same mixed-model program using a three-factor design. Interaction between medium and sex was significant only for the German-cued recognition response test. Cell means for interaction (Table 3) showed a tendency toward higher scores for English-cued responses for both boys and girls, regardless of medium or type of response. It would seem that beginning students tend to think in terms of their native language when memorizing foreign lexical items, regardless of medium, as indicated by these data. This is a very interesting outcome, as it might be assumed that music could provide a link in recall of words in the context originally learned without reference to their native language meanings.

A separate analysis was indicated for the factor of I.Q. since a significant F ratio between boys and girls for the media Dialog and Song was obtained. Five dependent variables consisting of I.Q. and the four difference scores were compared with the single factor, boy-girl, again using the mixed-model repeated measures analysis of variance program (BMD08V). The results are equivalent to those which would be obtained in performing a t test on each separate group. The main effect of I.Q. was not significant at the .05 level, although the mean I.Q. for boys was 110.16 while that for girls was 117.32. Correlations were also obtained for I.Q. with each of the test variables based on difference scores using program SFA01C (1969). They

afford an added verification of the overall results of the mixed-model analysis. The correlations are low, indicating that I.Q. was not an especially important variable in this study.

At the end of the experimental period, a final summary test (Z) was given. It included all the words previously tested, but in a context different from the original. All test items as printed on the test sheets were read to the subjects by the investigator because it was felt that the length of the test would afford an undue handicap to beginning students. Differences in means are given in Table 4. A drop in totals was not unexpected in view of the time lag between initial contact and retesting of some items, plus the difference in context. Surprisingly, the boys registered a gain in dialog item recognition, and a very small loss in song item recognition compared to the girls. Informal comparisons of total scores, $\bar{X}$ scores and differences between $\bar{X}$s for dialog-supplements and songs with the corresponding portions of test Z showed a uniform retention pattern, with one exception. A leveling seemed to have occurred so that $\bar{X}$ scores on test Z for words learned in dialogs and those learned in songs were more nearly equal for the boys and for the girls.

Although test Z required that the word learned be chosen from a group of three in order to complete a sentence not previously memorized, German meaning--that is, context meaning--clearly had to be recalled. While all tests were shown to be positively correlated by computer program SFA41D (1970), it is interesting that the highest correlations with test Z for both dialog and song tests were recall tests X and Y: The correlation between X_d and Z_d was .67; and between X_s and Z_s, .61; between Y_d and Z_d was .53; and between Y_s and Z_s .62.

A t test was performed to evaluate the difference in means of the total of scores obtained by the boys on the dialog tests and of the comparable portion of test Z. The t obtained is below the figure necessary for significance at the .05 level: $t = 1.04$ ($<.1$). The difference may probably be attributed to sampling error, or chance, but it is intriguing to speculate upon the possible effect that hearing the test items as well as reading them may have had upon the boys' scores.

The results of the study are summarized and presented in relation to the questions posed by the investigator in Table 5.

Implications for Language Learning

Since adding music automatically increases the volume of material to be learned, it is apparent that the Ss actually learned more within a given time span with music than when learning an equal number of words in sequences without music. Moreover, the songs themselves presented diverse texts and musical styles less closely related to one another and thus increasing the amount of information-carrying potential. This fact was reflected in lower inter-correlations for song tests than for dialog-supplement tests. These factors make the significant level of difference obtained in the study for the medium of music as a means of presentation even more important.

The fact that boys benefitted most from the addition of music is interesting in several respects: 1) Boys at the age of twelve are less physically mature than girls of the same age; 2) Norms for linguistic achievement are, in general, lower for boys of this age, and less interest is frequently exhibited by boys for language-oriented activities than by girls; 3) Boys have traditionally outnumbered girls in German classes,

however, often by a heavy majority.

The girls in this study scored almost equally well on tests regardless of the medium by which the items had been presented. The differences, as noted above, between boys and girls probably contributed to higher scores being attained by the girls. There is also some evidence that boys learn more easily with the addition of kinesthetic activity. Singing and simultaneous bodily response to rhythm represent a type of kinesthetic behavior and an additional sensory experience which may be factors that boys, in particular, need for more effective learning.

These conclusions may be evaluated also in relation to what the boys in this study said in answer to the questionnaire. They were generally less enthusiastic than the girls about singing per se, ans as a medium for learning German, if the answers are taken at face value. A log kept by the investigator reflects a very positive and enthusiastic attitude toward learning and singing the songs, however, throughout the course of the investigation on the part of both boys and girls.

It must also be noted that the Ss did not have time to learn the songs thoroughly in the conducting of this experiment, and even more significant results could be expected in retention tests had more complete mastery been achieved. At no time did students complain about not having time to learn the dialogs better as they did with the songs. Both groups involved in the study looked forward to hearing each new song and cooperated fully in learning it. Some students wanted to retain copies of the lyrics and even tape record the songs to take home and sing. Of course this could not be allowed during the experimental period, but very probably would have had an effect on scores had the students done so. Motivation, interest and enthusiasm were added bonuses associated with the learning-by-song treatment.

TABLE 1

FIVE-FACTOR ANALYSIS OF RETENTION SCORES

Source	SS	df	MS	F	P
Total	9833.69	1	9833.69	-	-
A - Sex	227.53	1	227.53	9.61	<.01
C - Media	13.06	1	13.06	4.14	<.05
B(A) - Error	851.66	36	23.66	-	-
AC - Interaction	29.69	1	29.69	9.41	<.01
BC(A) - Error	113.63	36	3.16	-	-

α .05 = 4.11

α .01 = 7.39

TABLE 2

CELL MEANS FOR INTERACTION: FIVE-FACTOR ANALYSIS

	$\bar{X}$	$\bar{X}$
	Dialog	Song
Boys	4.30	5.34
Girls	6.66	6.45
	Recognition	Recall
Dialog	7.30	3.66
Song	7.60	4.18
	German	English cued
Dialog	5.03	5.93
Song	5.58	6.21
Boys	Recognition	Recall
Dialog	6.13	2.47
Song	7.26	3.42
Girls		
Dialog	8.47	4.84
Song	7.94	4.94
Boys	German	English cued
Dialog	3.76	4.84
Song	5.05	5.63
Girls		
Dialog	6.29	7.03
Song	6.10	6.79
Dialog	German	English cued
Recognition	6.82 (Test V)	7.79 (Test W)
Recall	3.24 (Test X)	4.08 (Test Y)
Song		
Recognition	7.50 (Test V)	7.71 (Test W)
Recall	3.66 (Test X)	4.71 (Test Y)
	German	English cued
Boys	4.41	5.24
Girls	6.20	6.91
	Recognition	Recall
Boys	6.70	2.85
Girls	8.21	4.89
	German	English cued
Recognition	7.16	7.75
Recall	3.45	4.39
Boys	German	English cued
Recognition	6.29	7.11
Recall	2.53	3.37
Girls		
Recognition	8.03	8.39
Recall	4.37	5.42

TABLE 3

CELL MEANS FOR INTERACTION: THREE-FACTOR ANALYSIS

	$\overline{X}$	$\overline{X}$
Test V	Dialog	Song
Boys	5.47	7.11
Girls	8.16	7.90
Test W		
Boys	6.79	7.42
Girls	8.79	8.00
Test X		
Boys	2.05	3.00
Girls	4.42	4.32
Test Y		
Boys	2.90	3.84
Girls	5.26	5.58

TABLE 4

COMPARISONS OF DIALOG AND SONG MEANS AND TOTALS WITH TEST Z

	D_{tot}	$\overline{X}_{Dtot}$	S_{tot}	$\overline{X}_{Stot}$	D_z	$\overline{X}_{Dz}$	S_z	$\overline{X}_{Sz}$
Boys	315	17.50	387	21.50	350	19.44	342	19.00
Girls	486	27.00	467	26.28	395	21.89	384	21.33
Total	801	22.22	863	24.08	744	20.67	726	20.16

D_{tot} = Total score of dialog tests V, W, X, Y.

$\overline{X}_{Dtot}$ = Mean of total score of dialog tests V, W, X, Y.

D_z and $\overline{X}_{Dz}$ = Corresponding total and mean of dialog portion of test Z.

S_{tot} = Total score of song tests V, W, X, Y.

S_{Stot} = Mean of total score of song tests V, W, X, Y,

S_z and $\overline{X}_{Sz}$ = Corresponding total and mean of song portion of test Z.

TABLE 5

QUESTIONS AND CONCLUSIONS

Question	Sig. level on F test	Conclusions	Answer
1. Will there be a difference in retention scores when Ss are taught materials of different media consisting of songs and dialog-supplements?	<.05	The $\bar{X}$ retention score for songs was statistically different from the $\bar{X}$ retention score for dialog-supplements when all tests were combined for all subjects. The $\bar{X}$ score was higher for songs.	Yes
2. Will there be a difference in recognition retention scores?	>.05	No significant difference in relation to medium when tests V and W were separately analyzed. The statistics used did not provide a test of significance for the combined recognition tests. Higher $\bar{X}$ scores for songs contributed to the overall significant difference.	Inconclusive
3. Will there be a difference in recall retention scores?	>.05	No significant difference in relation to medium when tests X and Y were separately analyzed. The statistics used did not provide a test of significance for the combined recall tests. Higher $\bar{X}$ scores for songs contributed to the overall significant difference.	Inconclusive
4. Will there be a difference in retention scores between boy and girl Ss?	<.01	Differences very significant. Boys had a higher $\bar{X}$ score for songs in every response aspect studied. Girls had a higher $\bar{X}$ score for dialogs in 3 of the 4 tests. Girls scored generally higher than boys with only a small differential between dialog and song scores.	Yes
5. Will there be a significant interaction between kind of materials and sex of the Ss?	<.01 (combined tests) <.05 (test V)	Interaction was significant when scores for all tests were combined, but for Test V only when separately analyzed. Highest $\bar{X}$ retention scores were obtained by boys with song materials; slightly higher $\bar{X}$ retention scores were obtained by girls with dialog materials, except on test Y (English-cued recall). Sex alone was the significant differentiating factor for tests W, X, Y.	Yes (qualified)
6. Is there a difference in retention scores between boys and girls, is the difference in mean I.Q. between the two groups a significant factor?	>.05	I.Q. did not appear to be an important variable. Correlations obtained initially for I.Q. and media were also low.	No

TABLE 5 (concluded)

Question	Sig. level on F test	Conclusions	Answer
7. Will there be a difference when lexical units taught in different media are cued by English translations?	>.05	No significant difference in relation to media. (The difference between English-cued and German-cued responses without regard to medium was significant beyond the .01 level.) Interaction of English-cued response, medium, sex and type of response (recognition-recall) was not significant.	No
8. Will there be a difference in means of retention scores when lexical units are retested in a context different from the one taught to the Ss?	Not applicable	Informal comparisons of total scores, $\bar{X}$ scores and differences between $\bar{X}$s with the corresponding portions of test Z showed a uniform pattern of retention. In the new context an almost equal number of dialog and song words were remembered by the boys and by the girls. A leveling seemed to have occurred. A t test performed on boys' dialog $\bar{X}$ scores was not significant.	No

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